

REMARKS

In response to the objection to claims 9, 11 and 13, the formula for gadolinium oxide has been corrected by the insertion of the appropriate subscripts.

Claims 9-12 were rejected under 35 U.S.C. §102(b) as being anticipated by Komiya et al. (Komiya)

Reconsideration is requested.

The claims of the present application are denominated in "mass% of Al_2O_3 " while the composition of Komiya is defined in terms of weight % of $\text{Al}(\text{PO}_3)_3$ etc. This makes it impossible to directly compare the composition of Komiya with the claimed composition. For this reason, the compositions of the ingredients of the examples of Komiya have been converted to mass% on the attached tables for purposes of comparison.

In the glasses of the present invention, the Examiner has urged that the glasses of claims 9 and 11 of the present application are anticipated by Examples 5-12 and 15-20 of Komiya.

The MgF_2 , CaF_2 , SrF_2 and BaF_2 ingredients are effective for preventing devitrification of the glass and the proper total amount of one or more of these ingredients is 30 – 70 mass% as pointed out in claims 9, 11 and 13. In contrast, the total amount of these ingredients in Examples 5, 6, 8 – 12, 15 – 20 of Komiya is less than 30 mass %.

Further, in the present invention Gd_2O_3 is effective for increasing refractive index without decreasing the Abbe number, preventing occurrence of devitrification and improving chemical properties of the glass. If the amount of this ingredient exceeds 20%, it is undesirable because resistivity to devitrification is deteriorated and, therefore, the upper limit of this ingredient is 20% in the claims before the Examiner. In contrast, Example 7 of Komiya comprises Gd_2O_3 in the amounts of 23.85mass% which is outside the range of this ingredient in the present invention.

An advantage derived from a certain ingredient of glass and an amount of the ingredient required for obtaining such advantage are determined by relationship of this ingredient with other ingredients of the glass. Komiya does not disclose or even suggest a structure which satisfies the composition of all ingredients of the glass of the present invention. For these reasons, the Komiya patent fails to anticipate claims 9, 11 or 13 and it is requested that this ground of rejection be withdrawn.

Claims 9-12 were rejected under 35 U.S.C. §102(b) as being anticipated by Otsuka et al. (Otsuka).

Reconsideration is requested.

The claims of the present application point out the invention in terms of mass % while the Otsuka patent uses mol% to define the invention. Since these units may not be compared, the applicant has attached conversion tables which show the equivalent of the Otsuka compositions in terms of mass%. The Examiner stated that the glasses of claims 9 and 11 of the present invention were anticipated by Examples 1, 2, 6, 8 – 13 and 15 of Otsuka. In response claims 9 and 11 have been amended to point out that the amount of NaF is 0.1mass% which is less than the minimum of 0.15mass % as disclosed in Example 15 of Otsuka. It is noted that Claim 13 points out a composition having an Abbe number within a range of 95.1 -97.1 while Otsuka are limited to compositions having an Abbe number of 75-90.

For these reasons, the Otsuka patent fails to anticipate claims 9-12 and it is requested that this ground of rejection be withdrawn.

Claims 13-14 were rejected under 35 U.S.C. §102(b) as being anticipated by Nozawa.

Reconsideration is requested.

Since the composition of the glasses of Nozawa is defined in weight%, the composition of the glasses disclosed by Nozawa may not be compared with the compositions of the glasses defined by the claims of the present application which are in units of mass%. The attached chart includes a conversion of the composition of Nozawa's glasses the compositions of Nozawa may be compared with the glasses of the present claims. In converting KPF_6 and BaSiF_6 in Example 26 of TABLE 2, two methods have been employed. One method is based on a conversion to oxides, namely converting KPF_6 to K_2O and P_2O_5 and converting BaSiF_6 to BaO and SiO_2 . The other method is based on a conversion to fluorides, namely converting KPF_6 to KF and PF_5 and BaSiF_6 to BaF_2 and SiF_4 .

The Examiner stated that the glass of claim 13 of the present invention is anticipated by Example 26 of Nozawa. In view of the Examiner's comment, we have amended claims 13 to point out 0-28.30 mass% of aluminum trifluoride which is present to decrease dispersion of the glass and to prevent devitrification. In contrast, the glass of Example 26 of Nozawa comprises AlF_3 in an amount between 29.00% and 29.49% which is outside of the range of this ingredient in amended claim 13..

For the above reason, the glass of claim 13 of the present invention is not anticipated by Nozawa and it is requested that this ground of rejection be withdrawn.

An early and favorable action is earnestly solicited.

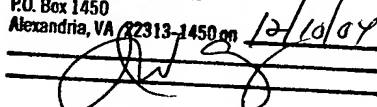
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Kusanya
Conversion of Examples
wt%

	MW	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
nd		1.56827	1.56879	1.56822	1.56874	1.57211	1.57484	1.57474	1.55275	1.57944	1.57487	1.54122	1.53580	1.54708	1.57274	
γ d		73.9	71.6	70.0	71.6	70.1	70.2	70.7	71.6	69.1	69.0	74.0	69.2	74.1	71.6	
AlPO ₄	268.897	30.0	20.0	30.0	17.0	25.0	25.0	25.0	17.6	30.0	30.0	17.0	34.0	18.8	24.0	
BaPO ₄	296.271				10.0											
SiPO ₄	240.664								8.0							
CaPO ₄	198.022															
MgPO ₄	182.345															
BaF ₂	175.824	45.0	40.0	35.0	22.0	35.0	37.0	38.0	35.6	60.0	60.0	22.0	36.0	25.8	41.0	
BaF ₂	128.617	20.0	20.0	20.0	13.0	23.0	24.0	27.0	14.4	5.0	5.0	13.0	20.0	14.4	20.0	
CaF ₂	78.078				15.0				12.0			15.0		12.0		
MgF ₂	62.302				8.0				6.4			8.0		6.4		
AlF ₃	83.977			5.0												
SiF ₄	214.246		5.0						1.0							
SiO ₂	362.498	5.0	15.0	20.0	16.0	5.0	10.0	6.0	15.0	15.0	5.0	15.0	16.0	18.0	8.0	
La ₂ O ₃	326.809					5.0									2.0	
Y ₂ O ₃	226.810							10.0							2.0	
Y ₂ O ₃	394.073					10.0									3.0	
Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
MgF ₂ -CaF ₂ -BaF ₂		65.0	60.0	55.0	68.0	60.0	60.0	60.0	58.4	85.0	66.0	58.0	61.0	58.6	61.0	

	MW	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
nd		1.56827	1.56879	1.56822	1.56874	1.57211	1.57484	1.57474	1.55275	1.57944	1.57487	1.54122	1.53580	1.54708	1.57274	
γ d		73.9	71.6	70.0	71.6	70.1	70.2	70.7	71.6	69.1	69.0	74.0	69.2	74.1	71.6	
AlPO ₄	268.897	0.1137	0.0758	0.0758	0.0644	0.0947	0.0947	0.0947	0.0687	0.0758	0.1137	0.0544	0.1137	0.0705	0.0909	
BaPO ₄	296.271				0.0899											
SiPO ₄	240.664								0.0326							
CaPO ₄	198.022														0.0404	
MgPO ₄	182.345															
BaF ₂	175.824	0.2567	0.2241	0.1998	0.1255	0.1998	0.2110	0.1882	0.1460	0.3122	0.3422	0.1255	0.1096	0.1472	0.2339	
BaF ₂	128.617	0.1592	0.1592	0.1592	0.1033	0.1990	0.1831	0.2149	0.1146	0.0398	0.0798	0.1095	0.1532	0.1146	0.1592	
CaF ₂	78.078				0.1921				0.1637			0.1923		0.1637		
MgF ₂	62.302				0.1264				0.1027			0.1284		0.1027		
AlF ₃	83.977			0.0895												
SiF ₄	214.246		0.0233													
SiO ₂	362.498	0.0138	0.0414	0.0552	0.0414	0.0138	0.0278	0.0188	0.0414	0.0414	0.0138	0.0414	0.0414	0.0414	0.0221	
La ₂ O ₃	326.809						0.0153								0.0061	
Y ₂ O ₃	226.810							0.0443							0.0089	
Y ₂ O ₃	394.073					0.0204									0.0078	
Total		0.5	0.5	0.5	0.7	0.5	0.6	0.6	0.7	0.6	0.5	0.7	0.7	0.7	0.6	
P	18.9884	0.8818	0.8447	0.8863	1.0229	0.7873	0.7873	0.7873	1.0482	0.7841	0.7841	1.0391	0.7177	1.0584	0.7841	

	MW	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
nd		1.56827	1.56879	1.56822	1.56874	1.57211	1.57484	1.57474	1.55275	1.57944	1.57487	1.54122	1.53580	1.54708	1.57274	
γ d		73.9	71.6	70.0	71.6	70.1	70.2	70.7	71.6	69.1	69.0	74.0	69.2	74.1	71.6	
P ₂ O ₅	141.348	16.14	16.14	16.14	18.52	20.17	20.17	20.17	18.02	16.14	24.30	21.60	24.30	20.74	19.35	
Al ₂ O ₃	101.961	5.80	3.66	3.66	3.58	4.63	4.63	4.63	3.40	3.66	5.80	3.28	3.60	3.60	4.64	
BaO	187.326				5.19											
CaO	100.619								3.58							
MgO	66.077															
BaF ₂	175.824	45.00	40.00	35.00	22.00	35.00	37.00	38.00	35.60	60.00	60.00	22.00	36.00	25.80	41.00	
BaF ₂	128.617	20.00	20.00	20.00	16.00	25.00	24.00	27.00	14.40	5.00	5.00	13.00	20.00	14.40	20.00	
CaF ₂	78.078				16.00				12.00			15.00		12.00		
MgF ₂	62.302				8.00				8.40			8.00		8.40		
AlF ₃	83.977			5.00												
SiF ₄	214.246		5.00						1.00							
SiO ₂	362.498	5.00	15.00	20.00	16.00	5.00	10.00	6.00	15.00	15.00	5.00	15.00	16.00	18.00	8.00	
La ₂ O ₃	326.809						5.00								2.00	
Y ₂ O ₃	226.810							10.00							3.00	
Y ₂ O ₃	394.073					10.00									3.00	
Total		73.8	63.9	63.9	81.3	79.8	79.8	79.8	81.2	83.5	75.6	78.8	75.6	79.5	80.6	
P	18.9884	16.802	16.019	17.028	20.878	16.147	14.978	15.519	19.013	14.516	14.516	20.879	13.031	19.691	14.935	

	MW	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
nd		1.56827	1.56879	1.56822	1.56874	1.57211	1.57484	1.57474	1.55275	1.57944	1.57487	1.54122	1.53580	1.54708	1.57274	
γ d		73.9	71.6	70.0	71.6	70.1	70.2	70.7	71.6	69.1	69.0	74.0	69.2	74.1	71.6	
P ₂ O ₅	141.348	81.83	19.84	19.24	29.73	26.27	26.27	26.27	28.19	19.24	81.83	27.40	31.83	28.10	24.01	
Al ₂ O ₃	101.961	7.05	4.61	4.61	4.63	6.06	6.06	6.06	4.19	4.61	7.05	4.18	4.61	4.62	6.76	
BaO	187.326				6.37											
CaO	100.619								4.16							
MgO	66.077															
BaF ₂	175.824	69.37	47.70	41.73	27.00	41.84	46.83	41.84	31.64	71.84	79.16	28.03	48.18	22.47	40.86	
BaF ₂	128.617	28.32	27.06	25.80	16.96	31.28	28.31	33.82	17.74	5.96	6.60	16.08	26.30	18.12	24.60	
CaF ₂	78.078				18.41				14.78			19.11		16.10		
MgF ₂	62.302				9.82				7.04			10.18		9.06		
AlF ₃	83.977			5.96												
SiF ₄	214.246		8.96						1.23							
SiO ₂	362.498	5.60	17.89	23.85	13.41	6.26	12.63	8.26	16.48	17.59	5.60	18.11	17.79	18.85	9.92	
La ₂ O ₃	326.809						8.26								2.48	
Y ₂ O ₃	226.810							12.83							2.43	
Y ₂ O ₃	394.073					12.83									3.72	
Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
P	18.9884	20.83	19.14	20.30	25.63	18.77	18.78	19.10	24.59	17.31	19.15	26.80	17.89	24.78	18.82	
MgF ₂ -CaF ₂ -BaF ₂		65.19	71.54	63.38	71.19	73.16	75.16	75.18	71.84	77.51	85.76	73.89	72.58	73.73	75.65	



Otsuka
Conversion of Examples
ml%

	MW	1	2	6	8	9	10	11	12	13	15
nd		1.5054	1.5097	1.5116	1.5011	1.5015	1.5058	1.5181	1.5037	1.4950	1.5304
v d		81.0	80.7	79.3	82.1	82.9	82.8	79.3	82.0	82.8	77.0
P ₂ O ₅	141.945	14.5	12.1	14.7	11.5	13.6	16.5	12.4	11.6	13.4	17.4
Al ₂ O ₃	101.961	3.5	1.5	3.5	3.5	4.9	5.1	9.3	3.3	4.1	4.5
BaO	153.326	1.0	6.6	2.2	1.0	0.8	1.2	0.7	1.7	1.2	3.8
AlF ₃	83.977	22.0	22.8	19.0	22.3	16.6	17.8	23.0	19.7	17.8	16.8
MgF ₂	62.302	7.0	3.0	16.0	6.7	4.8	3.9	3.7	4.6	3.9	3.2
CaF ₂	78.076	14.0	10.5	15.0	10.5	10.5	8.3	14.3	8.3	8.3	8.0
SrF ₂	126.617	20.0	17.3	11.6	20.6	25.3	13.0	12.4	11.2	32.7	20.2
BaF ₂	176.324	12.0	19.2	12.1	18.1	18.3	29.9	23.4	33.9	13.5	21.4
NaF	41.988	0.5	1.0	2.4	1.5	1.1	3.2	1.3	1.6	3.2	0.5
GdF ₃	214.245				0.9						
Gd ₂ O ₃	362.498	2.5	3.0	2.5	3.4	1.2	1.1	5.5	3.6	1.9	4.2
Y ₂ O ₃	225.810					3.5					
Yb ₂ O ₃	394.078			2.0							
CaO	56.077	3.0									
MgO	40.304		3.0								
total		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

part of weight

	MW	1	2	6	8	9	10	11	12	13	15
nd		1.5054	1.5097	1.5116	1.5011	1.5015	1.5058	1.5181	1.5037	1.4950	1.5304
v d		81.0	80.7	79.3	82.1	82.9	82.8	79.3	82.0	82.8	77.0
P ₂ O ₅	141.945	2058.2	1717.5	2086.6	1632.4	1930.4	2342.1	1780.1	1646.6	1902.1	2469.8
Al ₂ O ₃	101.961	366.9	152.9	366.9	356.9	438.4	520.0	336.5	326.5	418.0	458.8
BaO	153.326	163.3	1012.0	397.3	163.3	122.7	184.0	107.3	260.7	184.0	582.6
AlF ₃	83.977	1847.5	1914.7	1595.6	1872.7	1394.0	1494.8	1931.6	1654.3	1494.8	1410.8
MgF ₂	62.302	436.1	186.9	934.5	417.4	209.0	243.0	230.5	209.0	243.0	199.4
CaF ₂	78.076	1093.0	819.8	1171.1	819.8	819.8	648.0	1116.5	655.8	648.0	624.6
SrF ₂	126.617	2512.3	2173.2	1457.2	2587.7	3178.1	1633.0	1557.6	1405.9	4107.7	2587.5
BaF ₂	176.324	2103.9	3366.2	2121.4	3173.4	3208.4	5242.2	4102.6	5943.5	2368.9	3761.9
NaF	41.988	21.0	42.0	100.8	69.0	46.2	134.4	54.6	75.4	134.4	21.0
GdF ₃	214.245	0.0	0.0	0.0	192.8	0.0	0.0	0.0	0.0	0.0	0.0
Gd ₂ O ₃	362.498	906.2	1087.5	906.2	1232.5	435.0	398.7	1993.7	1305.0	688.7	1822.5
Y ₂ O ₃	225.810	0.0	0.0	0.0	0.0	790.3	0.0	0.0	0.0	0.0	0.0
Yb ₂ O ₃	394.078	0.0	0.0	788.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CaO	56.077	168.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MgO	40.304	0.0	120.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
total		18.9984	3277.2	3218.3	3168.9	3474.8	3205.0	3168.9	3379.8	3372.2	3294.3
F											

mass%

	MW	1	2	6	8	9	10	11	12	13	15
nd		1.5054	1.5097	1.5116	1.5011	1.5015	1.5058	1.5181	1.5037	1.4950	1.5304
v d		81.0	80.7	79.3	82.1	82.9	82.8	79.3	82.0	82.8	77.0
P ₂ O ₅	141.945	17.68	13.64	17.60	13.06	15.25	18.24	13.34	12.12	15.61	18.19
Al ₂ O ₃	101.961	3.06	1.21	3.01	2.85	3.46	4.05	2.55	2.48	3.43	3.38
BaO	153.326	1.32	8.04	2.85	1.23	0.97	1.43	0.81	1.92	1.51	4.29
AlF ₃	83.977	15.85	15.20	13.46	14.98	11.01	11.64	14.64	12.13	12.26	10.39
MgF ₂	62.302	3.74	1.48	7.88	3.34	2.36	1.89	1.75	2.20	1.99	1.47
CaF ₂	78.076	9.38	6.51	9.88	6.56	6.47	5.05	8.46	4.83	5.32	4.60
SrF ₂	126.617	21.55	17.26	12.29	20.70	25.10	12.72	11.81	10.34	33.70	18.69
BaF ₂	176.324	18.05	26.73	17.89	25.38	26.34	40.83	31.10	43.76	19.42	27.63
NaF	41.988	0.18	0.33	0.85	0.50	0.36	1.05	0.41	0.56	1.10	0.15
GdF ₃	214.245	0.00	0.00	0.00	1.54	0.00	0.00	0.00	0.00	0.00	0.00
Gd ₂ O ₃	362.498	7.77	8.64	7.64	9.86	3.44	3.11	15.11	9.61	6.56	11.21
Y ₂ O ₃	225.810	0.00	0.00	0.00	0.00	6.24	0.00	0.00	0.00	0.00	0.00
Yb ₂ O ₃	394.078	0.00	0.00	6.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CaO	56.077	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MgO	40.304	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
total		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
F		18.9984	28.1	25.6	26.7	27.8	25.3	24.7	25.6	24.8	21.9

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Nozawa
Conversion of Example 26
wt%

	MW	26
nd		1.43937
v d		95.3
KPF ₆	184.062	2.00
BaSiF ₆	279.408	4.00
AlF ₃	89.977	29.00
YF ₃	145.901	3.00
MgF ₂	62.302	4.00
CaF ₂	78.075	15.00
SrF ₂	125.617	11.00
BaF ₂	175.824	28.00
P ₂ O ₅	141.945	4.00
total		100.0
F	18.998	

When all of KPF₆ and BaSiF₆ was converted into oxide:-->26-a
When all of KPF₆ and BaSiF₆ was converted into fluoride:-->26-b

	MW	26-a	26-b
nd		1.43937	1.43937
v d		95.3	95.3
P ₂ O ₅	141.945	0.034	0.038
PF ₅	125.966		0.011
K ₂ O	94.196	0.005	
KF	58.097		0.011
BaO	153.328	0.014	
BaF ₂	175.824	0.160	0.174
SiO ₂	60.084	0.014	
SiF ₄	104.079		0.014
AlF ₃	88.977	0.345	0.345
YF ₃	145.901	0.021	0.021
MgF ₂	62.302	0.064	0.064
CaF ₂	78.075	0.192	0.192
SrF ₂	125.617	0.088	0.088
total		0.937	0.948
F	18.998	2.105	2.256

	MW	26-a	26-b
nd		1.43937	1.43937
v d		95.3	95.3
P ₂ O ₅	141.945	4.771	4.000
PF ₅	125.966	0.000	1.889
K ₂ O	94.196	0.512	0.000
KF	58.097	0.000	0.531
BaO	153.328	2.195	0.000
BaF ₂	175.824	28.000	30.510
SiO ₂	60.084	0.880	0.000
SiF ₄	104.079	0.000	1.490
AlF ₃	88.977	29.000	29.000
YF ₃	145.901	3.000	3.000
MgF ₂	62.302	4.000	4.000
CaF ₂	78.075	15.000	15.000
SrF ₂	125.617	11.000	11.000
total		88.338	100.000
F	18.998	39.989	42.860

mass%

	MW	26-a	26-b
nd		1.43937	1.43937
v d		95.3	95.3
P ₂ O ₅	141.945	4.85	4.00
PF ₅	125.966	0.00	1.87
K ₂ O	94.196	0.52	0.00
KF	58.097	0.00	0.83
BaO	153.328	2.28	0.00
BaF ₂	175.824	28.47	30.51
SiO ₂	60.084	0.87	0.00
SiF ₄	104.079	0.00	1.49
AlF ₃	88.977	29.49	29.00
YF ₃	145.901	3.03	3.00
MgF ₂	62.302	4.07	4.00
CaF ₂	78.075	15.25	15.00
SrF ₂	125.617	11.19	11.00
total		100	100
F	18.998	40.67	42.86

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